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Dr. Mr. Amme:

Congratulations on completion of the three draft Vegetative EIS documents! Certainly you, and many others deserve lots of credit for all the hard work in preparing such complex, large and professional documents. I hope my comments do not appear too critical – they are only meant to be constructive. My only intent is to try to help protect our public lands from the accelerating onslaught of weeds. I apologize for not getting this information to you earlier. I knew you were preparing an EIS but it did not occur to me to forward my data to you.

I am deeply concerned that there is so little information in the EIS and PER about the seriousness of current and future weed infestations and the impacts from those weed populations. In comparison to the enormous volume of information and text in the EIS, PER and Appendixes, the number of sentences and information about the problem with weeds is miniscule. An exception to that would be the confusing issue of annual grasses and fire (no reflection on the EIS). There is great discourse on the effects of the proposed treatments upon vegetation, air, water, people, soils, wildlife, etc., but scarce little text on what effect weeds have on those resources and people.

Steve Dewey, Utah State University, says: "When considering the long-term ecological effects on the land, invasion by aggressive non-indigenous noxious weeds is far more damaging than any wildfire." (Biological Wildfire brochure, Utah State University, attached).

I need to quote from a National Geographic book entitled: "Alien Invasion" (Devine 1998): "In his quest to make the dangers of invasive plants clear to the public and policy makers, Asher developed a succinct statement. To be sure he wasn't exaggerating, he ran it by a host of resource professionals and weed scientists. Most found it accurate; those who disagreed thought it too understated. 'Thousands of watersheds in the West are rapidly undergoing the greatest permanent (with today's economics and technology) land degradation in their recorded history,' Asher worries about sounding like an alarmist, but is it alarmist to sound the siren when the building is on fire?"

> Following that book in 1998 I added the words: "public land" before the word watersheds. I've given over one hundred picture slide presentations and co-authored three published papers since then, always using that "greatest permanent land degradation statement". Before all presentations (including 8 congressional presentations, 2 legislative, many university weed science departments, many State Directors, Associate State Directors, and key State Departments of Agriculture, BLM, Forest Service and National Park Service staff, and many

> national conferences.). I have always begun the presentations with a firm and genuine request for anyone to challenge or disagree with my statements- saying: "I want to learn from my presentations". No one has ever even hinted that the "Public land watersheds statement" was exaggerated or inaccurate.

Now as I read the Summary and Proposed Action/ Purpose and Need in the EIS I am greatly surprised and gravely concerned. Out of about 840 sentences in those sections, there are only three condensed sentences (two of those are duplicates) that discuss what the problem is with weeds. Throughout the rest of the EIS and all of the Environmental Report there are only a very few, short, rare sentences relating to the damage caused by weeds, and those sentences are buried in those massive documents.

If the previous EIS's are any indication, thousands of people from all walks of life will be reading the EIS's, but not understanding the gravity and urgency of the situation. Human health risks, including cancer are prominently displayed so that people can evaluate the risks in comparison with the resource damage caused by weeds. As stated in the EIS, herbicides use is the primary issue of controversy. Judges, BLM managers at all levels, conservation organizations, and concerned individuals – to name a few – will be wondering: why should BLM take the human and wildlife health risks along with the other risks? Without a detailed description of the degradation/impacts underway from weeds how can the readers answer that risk question? Furthermore, whether intended or not, this document will be used by hundreds of people to help develop more awareness and support for increased weed management – to protect public lands.

My comments mostly pertain to the EIS but also pertain to the Environmental Report (ER) where the text is almost identical to the places I am commenting on in the EIS. With considerable hesitation I attached a resume of my weed work. Perhaps it will lend more credibility and weight to my comments.

COMMENT 1. The problem with weeds is the severe, widespread and often permanent (discussed later) multi-faceted damage they cause. I can find only a very little information about those impacts.

SUGGESTION 1. Give more detailed explanation of the problem/impacts from weeds in the Summary, Purpose and Need sections especially, and elsewhere in the EIS and similar places in the PER. For example:

> In the PNW Region, Invasive Plant EIS, pgs. 3-1 to 3-68 have lots of commentary about the aggressiveness and damage from weeds. Please look closely at those pages. Some examples from those pages are: "Spotted knapweed is an aggressive competitor and produces an allelopathic compound."(pg.3-8). "Yellow starthistle forms solid stands that dramatically reduce forage for livestock and wildlife. This species causes a fatal neurological disorder when ingested by horses called chewing disease." (pg. 3-9). "Soil erosion more than doubled in knapweed dominated areas compared to uninfested areas" (pg 3-28). "Invasion by purple loosestrife makes habitat unsuitable for numerous birds, reptiles and mammals"

(pg 3-49). “Known effects of invasive plants to wildlife: embedded seeds leading to injury or death, scratches leading to infection, ingestion of plant parts leading to poisoning, cascading effect of direct or indirect mortality on other species” (pg 3-49) (USDA. 2005)

And further from the PNW EIS (pg-349): Trammel and Butler (1995) found that deer, elk, and bison avoided sites infested with leafy spurge. Tamarisk stands have fewer and less diverse populations of mammals, reptiles, and amphibians (Jakl and Gatz 1985; Olson, 1999). Invasion by purple loosestrife makes habitat unsuitable for numerous birds, reptiles and mammals (Kiviat, 1996; Lor, 1999; Rawinski, 1982; Thompson, Stuckey, and Thompson, 1987; Weihe and Neely, 1997; Weiher et al., 1996)

The Wilderness Act of 1964 and policy mandates that wilderness be managed to ensure that natural conditions are preserved and ecosystems and ecological processes function naturally. Invasive weeds violate that law and policy (Asher and Harmon, 1995).

“The devastation from these alien plants includes enormous economic losses to agriculture and irreparable ecological damage to wildlands” (Biological Wildfire brochure, Steve Dewey – enclosed)

The rapid growth of many invasive plants allows them to out-compete native vegetation. This competitive advantage results in the loss of functional riparian communities, loss of rooting strength and protection against erosion, decreasing slope stability and increasing sediment introduction to streams, and impacts on water quality (Donaldson, 1997)

Some invasive plants (such as knapweed) contain chemical compounds that make the plant unpalabtable to grazing animals. Chemical compounds in these invasive plants disrupt microbial activity in the rumen, or cause discomfort after being ingested, resulting in a reduced or avoided consumption of the invasive plant (Olson 1999)

Native plants with cultural significance, such as camas and bitterroot, are declining in number across the western landscape. This decrease is of great concern to many tribes, as traditional gathering areas have experienced a decline in productivity due to anthropogenic influences of the past century and the proliferation of invasive plant species - especially spotted knapweed and sulfur cinquefoil (Bonnicksen, 1998).

Numerous studies demonstrate reduced numbers and/or diversity in birds, reptiles, small mammals, and insects in stands of non-native plant species. (Huenneke, 1996) For example, kangaroo rat and ground squirrel populations were severely reduced or totally eliminated on sites infested with Russian knapweed in a study in Wyoming (Johnson, 1994).

Studies in Montana show that spotted knapweed invasions reduced available winter forage for elk between fifty and ninety percent (Duncan, 1997).

Research shows that the total number of insects, total insect biomass and taxonomic richness of invertebrates associated with giant reed are significantly lower than that associated with native vegetation (Herrera 1997).

Giant reed uses about three times as much water as the native plants, introduces an unnatural fire cycle into the ecosystem, and it easily replaces entire plant communities (Iverson 1993, Bell 1993, Reiger and Kreager 1989)

Knapweeds are the best regional (Pacific Northwest) symptom of desertification, the loss of the productive potential of the land (Roche, 1988).

One of the five indicators for evaluating the susceptibility for desertification is exotics (plants) as a percent of total cover (Mouat, et. al., 1993).

The severe level of deterioration in four desertification classes is described in part as follows: "Undesirable forbs and shrubs have replaced desirable grasses or have spread to such an extent that they dominate the flora" (Dregne, 1977).

Aggressive foreign plants spread quickly into natural areas, monopolize resources, and push out native flora and fauna - including endangered species (Cheater, 1992).

The simplest effect of some invasions is the displacement of native plant species, by simple crowding, by competition for resources, or by other mechanisms. Many invasive plants form broad-leaved rosettes or in some other way shade out neighbors (Huenneke, 1996).

The impact of purple loosestrife on native vegetation has been disastrous, with more than 50 percent of the biomass of some wetland communities displaced. Monospecific blocks of this weed have maintained themselves for at least twenty years (Thompson, 1987).

In the absence of predators, immune systems or other biological control mechanisms adapted to counteract these species, populations of some exotics have exploded (Monnig, 1992).

Infections in the eyes, mouth, and throat commonly occur in cattle and sheep feeding where medusahead is present (Bovey, 1961; Hilken, 1980).

In Oregon, 83 million dollars of personal income are lost from just 21 of the 91 noxious weeds in the state. (from an Economic Analysis that can be obtained with a phone call to Ore. Dept. Of Ag, Tim Butler, 503, or 541-0986-4625)

Annual economic impacts of leafy spurge infestations on grazing and wildlands in

Montana, North Dakota, South Dakota, and Wyoming are approximately $129,000,000 (Leitch, 1994).

The reduction in wildlife-associated recreation expenditures due to current leafy spurge infestations on wildlands in North Dakota is estimated to be $2,900,000 (Wallace 1992).

In Montana, knapweed infestations result in an estimated direct annual impact of $14,000,000 with total secondary impacts of about $42,000,000 per year which could support over 500 jobs in the states economy (Hirsch and Leitch, 1997).

Without repeated investments of $100 per acre, Scotch broom partially blocks reforestation efforts and reduces growth rates of surviving trees on some timber harvest units in western Oregon (Fairchild, 1997). Similarly, rush skeletonweed is retarding forest regeneration, especially after fires, on the Boise National Forest (Ririe and Stearns, 1997).

Many studies and repeated landowner experiences show that weeds commonly reduce livestock carrying capacity from thirty-five percent to ninety percent (Hilken, 1980; Bucher, 1993; Harris, 1988).

Runoff and sediment yield were fifty-six percent and 192 percent higher, respectively, for spotted knapweed than for bunch grass vegetation types (Lacey, 1989).

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Salt cedar, a deep rooted shrub or small tree, uses an excessive amount of water. A mature salt cedar consumes as much as 800 liters of water per day -- 10 to 20 times the amount used by native species it tends to replace (Cooperrider, 1995).

Tamarisk (also known as salt cedar) has been able to out compete willow and other riparian plants in many locations, greatly diminishing the quantity and quality of riparian habitat for migrant songbirds and vegetation dependent birds, like the endangered Yuma clapper rail at the Salton Sea and elsewhere (Dudley, 1995).

Tamarisk dominated riparian areas have depauperate faunas, even in the native range of tamarisk (Lovich, 1996).

A study by DeLoach (1991) in the Lower Colorado Valley showed that for the entire year, salt cedar had only fifty-nine percent of the mean density of birds as the cottonwood-willow, screwbean and western honey mesquite communities. During the winter, saltcedar had only thirty-nine percent of the density of birds as other vegetative communities.

The leaf litter of salt cedar increases soil salinity so that large areas are unfit for native vegetation and the wildlife that depend on that vegetation

The roots of some noxious weeds, yellow starthistle, leafy spurge, and rush skeletonweed for example, grow deeper into the soil profile than many native plants. Thus, the weeds can tap nutrient and water horizons not available to native plants. (Larson, 1997).

Spotted knapweed has been found to reduce grass production from 60-90 percent (Harris and Cranston 1979, Bedunah and Carpenter 1989, Wright and Kelsey 1997) decreasing carrying capacity for livestock and lowering the quality of winter range habitat for wildlife (Rice et.al. 1997.)

Spotted knapweed produces a chemical, called catechin, that causes native vegetation to die (Kahn 2003)

In some parts of Theodore Roosevelt National Park , leafy spruge diminished bison forage by 83 percent and deer and elk forage by 70 percent (Stalling 1998)

Lesser yellow legs and other shorebirds use shallow water areas in wetlands. They prefer habitats that are open, with low-profile vegetation and low plant cover, like flooded mud flats. Such areas are quickly invaded by reed canarygrass, which makes them unsuitable habitat for shorebirds. Foraging habitat for the 25 species of shorebirds, that use the Turnbull National Wildlife Refuge, in Washington, when migrating, has been substantially reduced by the weed (Rule 2004).

Shallow, flooded, seasonal wetlands are important habitat for the migration, pairing and brood rearing of many of the duck species, especially mallards, cinnamon and blue-winged teal, and green-winged teal, on the Turnbull Wildlife Refuge. Once invaded by reed canarygrass these areas have less diverse and less abundant food resources. The dense thatch layer that develops also restricts access to these food resources. (Rule 2004)

Aspen-dominated riparian communities on the Turnbull Wildlife Refuge refuge are the most important Habitat for 65 species of land birds. Reed canarygrass invades the understory of many of these stands. This reduces structural and floral diversity by impeding the growth of native understory shrubs and forbs. It also impedes the regeneration of aspen. The result is a significant decline in habitat diversity, which may lead to as much as a 50-percent decrease in bird species diversity (Rule 2004)

The impact of purple loosestrife on native vegetation has been disastrous, with more than 50 percent of the biomass of some wetland communities displaced. Monospecific blocks of this weed have maintained themselves for at least twenty years (Thompson, 1987).

In its native habitat, purple loosestrife only comprises one to four percent of the native vegetation, but in North America densities of up to 80,000 stalks per acre have been recorded (Strefer, 1996).

Purple loosestrife out competes native plant species and reduces biodiversity (Nyvall 1995)

Endangered, threatened, and rare birds completely avoided invasive Phragmites while utilizing neighboring short grass wetlands (Benoit, 1997)

One study showed that when chukar partridge were given free access to all the medusahead caryopses (seed) they would eat, along with other dietary requirements, they suffered dramatic losses in body weight (Savage, 1969).

Research concerning chukar partridge habitat use and availability in the severely infested lower Salmon River Canyon of Idaho, revealed that chukars selected against (avoided) habitats with higher yellow starthistle ground cover (Lindbloom 1998).

COMMENT 2. The Executive Summaries and the Purpose and Need, discuss the history of fire as follows: "..severity and intensity of wildfires in the West has increased dramatically…". I can't find similar comments about the weed expansions that have occurred all over the west.

SUGGESTION 2. Say something similar about weeds in the Summary and Purpose and Need sections of the BLM EIS and PER because weeds have also increased dramatically. The following examples support that:

Yellow starthistle was first reported near San Francisco and Seattle in the mid 1800's. Today it infests over 12 million acres in California and many millions of acres in Oregon, Washington and Idaho.

In 1993, Jackson county in southern Oregon, and Umatilla county in north east Oregon both reported explosions of yellow starthistle with over 100,000 acres in Jackson county and 200,000 acres in Umatilla county. Now, both counties report that the populations have at least doubled.

In 1970, there was about thirty-two acres of leafy spurge in the Theodore Roosevelt National Park in North Dakota. The use of herbicides was not allowed and now leafy spurge dominates over 4,400 acres of the park (Andrascik, 1997).

From just a few plants in western Idaho in 1954, rush skeletonweed now infests over four million acres as it continues to "leapfrog" to the east, now out beyond Shoshone, Idaho, and to the west into the Hells Canyon National Recreation in Oregon and Idaho.

Or, ask any western weed scientist and they will explain and provide information on how weeds have increased dramatically.

COMMENT 3. The reader needs to learn about the common permanency (some authors

call it “irreversible”) to many weed invasions.

SUGGESTION 3. Add some language in the Summary and Introduction and Purpose and Need like the following:

> “The impact of (weed) invasions can be permanent when economic and environmental factors limit the ability of a managing agency to restore the ecosystem to a healthy state” (National Academy of Sciences 1992) (pg 3-26 USDA EIS 2005)
>
> “…Ecological damage from extensive noxious weed infestations is often permanent” (Utah State, Biologcial Wildfire brochure – enclosed)
>
> “Loss of wildlife habitat function would be irretrievable” This is a great sentence in your BLM EIS, under Cumulative impacts, pg 2-32. However, it is very small print buried in a table. Similar language needs to be “up front” in the text of the document.

COMMENT 4. “The BLM estimates that nearly 36 million acres of public lands were infested with weeds in 2000, and the invasive plants and noxious weeds are spreading at approximately 2300 acres per day..” (pg 3-26) Great that you included this information that is critical to helping people understand the severity of the situation.
However, it is “buried” back deep in the huge document.

SUGGESTION 4. Include that 2300 acres per day increase in the Summary and the Proposed Action/Purpose and Need sections of the EIS and Environmental Report. That is where the Forest Service put their similar estimate of weed spread (USDA 2005 pg. 1-2) Support and credibility for continuing to use that statement are as follows:

> A White Paper entitled: “Estimated Annual Rates of Weed Spread on Western Federal Wildlands” (Asher and Dewey, 12/20/05) is attached.
>
> “A Biological wildfire is gradually consuming large areas of the American landscape. Nonnative plant invasions are sweeping across the nation into croplands, pastures, forests, wetlands, and waterway, wilderness areas, parks and refuges, and highway rights of way. (Invasive Plants, Changing the Landscape of America – FICMNEW Fact Book. Preface)
>
> “…BLM estimates that nearly 36 million acres of public lands were infested with weeds in 2000…”. “BLM treated approximately between 250,000 and 320,000 a acres of noxious weeds during 2001 and 2004. (pg. 3-326). On average then, BLM is treating about 285,000 acres per year. Therefore, since BLM is treating less than one percent of the weed acreage, it would appear that 35 million acres are growing and spreading unchecked. (I know BLM does not intend to treat all weed acres). If that 35 million is exaggerating, suggest substituting the acreage

that is growing unchecked - and the amount of weeds spreading unchecked (out of control) will still be enormous.

In one research area in Colorado, dalmation toadflax recently increased 1,200 percent over a six year period (Beck, 1998)

Quoting from one EIS: "Weeds are spreading rapidly, and in some cases exponentially, in every cluster and sixty-six percent of the BLM/FS lands are susceptible to knapweeds and yellow starthistle" (USDA/USDI, 1997).

The Departments of Agriculture in eleven western states estimate that there are about 70,000,000 acres of invasive weeds on private, state and federal wildlands. Essentially, this means there are 70,000,000 acres of weed seed being produced every year, much of which is being carried to other wildlands by wind, water, wildlife, livestock, people and equipment. Consequently, just as predictably as lightning strikes ever year, anywhere, all the public lands are either under attack or need to be considered to be under attack, from these weed seeds. (Asher 98)

Like human populations, weeds typically increase exponentially beginning slowly, then doubling and redoubling (Kummerow, 1992).

There were only minor populations of spotted knapweed in Montana in 1920. Today, there are about five million acres with another 29 million acres of highly susceptible land in that state alone (Duncan, 1997)

COMMENT 5. Frequently in this BLM EIS and PER, weak terms like *threaten, likely, may*, etc. minimize the seriousness of the weed situation. For example:

"Invasive vegetation and noxious weeds *threaten* soil productivity, water quality, etc" (pg. Exec. Summ. 1). That statement is tentative as though something might happen, when in fact soil productivity, water quality, wildlife habitat have been and continue to be damaged and degraded on a massive scale. The term *threaten* does a great dis-service when used to describe on-going and future weed problems. Furthermore, the general public hears that term almost everyday, certainly every week in the news media. However, with weeds, the "enemy" has invaded, it dominates much of the landscape, and it is advancing on a multitude of fronts. .

SUGGESTION 5. Replace *threaten* with damages, degrades, deterioration, blocks ability to meet management objectives, weeds are taking over and dominating many areas.

COMMENT 6. Frequently in the EIS, other weak words severely lessen the accuracy of the descriptions of what is happening on the ground on many millions of BLM acres. For example:

Under alternative C (no herbicides) pg. 2-29: "It *could* be more difficult to

effectively treat unwanted vegetation…". Does anyone doubt that it won't be more difficult? "Invasive plant populations would *likely* continue to spread…"(same statement sixth para. pg 4-114, second full para. pg. 4-119)). Is there doubt that the weeds will continue to spread with no herbicide use? "There would be no risk to TES species…" (because of no herbicides). What about the risk from unchecked weeds out competing the TES species? It is beyond a *risk* because weeds are and will continue to out compete TES species.

Under the No Action alternative, "As a result, invasive species would *likely* continue their rapid expansion across western landscapes" (last para pg 4-61) Does anyone think the weed spread will stop?

SUGGESTION 6. Under Cumulative Effects, pg 2-32: "Habitat loss *would* continue…" Great wording! Much more actual, on the ground reality like that is needed. Replace *could, likely* and other similar words with active, concrete terms that match what is actually happening and will, without a doubt, continue to happen. For example from the Forest Service Invasive Plant EIS (USDA 2005):

"Invasive plants *are currently damaging* biological diversity…" "Invasive plants *create* a host of environmental effects…". "Invasive plants *spread* between National Forests lands to neighboring areas…". (pg. Summary. 1). Under No Action, Pg. Summary. 11, "…the underlying need for action *would not* be met. Continued Invasive plant spread *would compromise* and limit the ability of the Forest Service…"

Suggest placing those type of sentences where they appropriately belong throughout the BLM EIS in the Summary and Proposed Action and Need and the PER – like the Forest Service EIS.

COMMENT 7. "…competition with other species, influenced by the introduction of non-native invasive plant species, has had a *profound* effect on native vegetation" (BLM EIS 3rd para. Pg. 3-19, and first para. pg 4-42, and PER 7th para, pg. 4-31). Was the effect positive or negative?

SUGGESTION 7. If the effect was negative, a *profound* effect of weeds usually means devastating or seriously damaging on vast scale. Suggest instead of "profound effect" using devastating, seriously damaging or irreversible degrading. Those kind of words more accurately reflect what has and will continue to happen on the ground.

COMMENT 8. "Noxious weeds are undesirable plants that infest either land or water resources, and *may* cause physical and economic damage…." (last para pg. 3-25) "Weed infestations *are capable* of destroying wildlife habitat; reducing opportunities for hunting, fishing…". (EIS first para, pg. 3-26, PER 4th para. pg. 3-39) The words *are capable* leaves the reader wondering: "Does it happen? If so, is it a rare occurrence?

SUGGESTION 8. To more accurately reflect field conditions, suggest replacing *may* and *are capable* with usually, or commonly, or frequently.

COMMENT 9. "Today, the rapid expansion of invasive species (that includes animals. Do you mean plants? across public lands is one of the primary *threats* to ecosystem health…". (first para pg 4-42). The word *threat tells the* reader that *maybe* the weeds will keep expanding. Is there any doubt that they will keep expanding. Please refer to Suggestion # 11 that discusses weed are spread.

SUGGESTION 9. Delete *threat* and change that sentence to read: "Today the rapid expansion of invasive plants across public lands is causing massive and often permanent (with today's economics and technology) damage to ecosystem health and is one of the greatest challenges to ecosystem management"

COMMENT 10. The first EIS full para. pg. 4-65, needs to be more accurate.

SUGGESTION 10. Replace *likely spread* with will spread. Insert "permanent" before "damage". Please also see all of Suggestion 4. And, add "steep rocky terrain" in the "e.g. parenthetical para.

COMMENT 11. "Currently, the funding and labor resources available to combat weeds dictate a *containment* strategy." (para 6 pg. 2-2). How will the reader know what containment means? I can't find that word defined in the EIS.

SUGGESTION 11. Explain what containment means. And, MORE IMPORTANTLY, please explain what elements of Integrated Weed Management don't get accomplished with the current funding/labor resources. Surely there is a way to word the sentences consistent with EIS document guidelines, while still getting the message across about what won't be accomplished. For example:

> IPM includes prevention, education, detection, control, restoration, and monitoring. Currently, the funding and labor resources available dictate that only weed control for containment can be accomplished.

Hopefully you can insert considerable information, like a few pages or a section, in the EIS and PER about the impacts, i.e. what is the problem with weeds? Otherwise, how will the reader even begin to grasp why we want to use herbicides and treat so many acres of weeds? If lots of detail about the problem with weeds is not possible in the EIS and PER, then perhaps a companion document could prepared and referenced in the EIS, that would comprehensively describe the problem/challenges, since the EIS and PER comprehensively describe the solution.

What is the overarching goal of the EIS and PER? My understanding is that the main goal or hugely parallel goal, is to have the public, judges, conservation organizations, State Directors, Managers at all levels (that are under pressure from the public to not use herbicides) etc.,to either support or not resist BLM's use of herbicides to manage and

protect the public lands. How can this goal be met without an adequate, preferably comprehensive discussion about the problems caused by weeds in the EIS and PER? This is a big deal! Thousands of acres of public land are being permanently damaged (with today's economics and technology) each year because of the current financial and legal restrictions that keep BLM from apllying the appropriate and effective herbicides.

In summary, you can see that I am hoping for changes in the EIS and the Environmental Report that will give the reader a better sense of the gravity and urgency of the problem. What other major challenge does BLM face, other than wildhorses, that multiplies itself – and in this case exponentially over vast areas?

I sincerely and genuinely thank you for all of your dedicated and outstanding weed work!

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Attachments:
- Noxious Weeds: A Biological Wildfire
- Estimated Annual Rates of Weed Spread on Western Federal Wildlands
- Jerry Asher's Invasive Plant Experience

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